



Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Department of Allied Medical Sciences
First Semester 2013-2014

Course Information	
Course Title	Geometrical & Physical Optics
Course Code	(OPT 215)
Prerequisites	General Physics (Physics 103)
Course Website	
Instructor	Adnan Jaradat
Office Location	PH ₄ :L0
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Office Hours	
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Teaching Assistant(s)	
Course Description	
<p>1- Nature of light and speed of light measurements. 2- Reflection and Refraction of light. 3- Huygens's Principle, Dispersion of light & Prisms. 4- Geometric Optics, Image formed by Flat and Spherical Mirrors. 5- Image formed by Refraction. 6- Thin Lens and Camera. 7- The image formed by the eye. 8- Common Vision Defects. 9- Simple Magnifier and Compound Microscope and Telescope. 10- Interference of light. 11- Diffraction and Polarization. 12- Laser Light: Properties and applications.</p>	

Textbook	
Title	Physics for Scientists and Engineers with Modern Physics.
Author(s)	Raymond A. Serway & John W. Jewett.
Publisher	BROOKS/COLE CENGAGE Learning
Year	2010
Edition	Eighth Edition
Book Website	www.cengage.com
Other references	1- Clinical Optics by Elkington, A. R. 2nd & 3rd Editions. 2- Optics by Freeman, M. H. 3- Clinical Optics, Basic and Clinical Science Course by American Academy of Ophthalmology 2006-2007.

Assessment		
Assessment	Expected due date	Percentage
First Exam		25%
Second Exam		25%
Final Exam		40%
Participation		5%
Attendance		5%

Course Objectives	Percentage
Discussion of the nature of light, Rays, waves, and particles. Dual nature of light.	5%
Specular and diffuse reflection.	5%
Huygens's Principle, and the interpretation of reflection and refraction at the interface of two different optical media.	5%
Laws of reflection and refraction, and application of these laws.	10%
Application of law of reflection at flat and spherical surfaces, and formation of image by reflection.	10%
Snell's law and its application in the image formation by refraction. The total internal reflection in the optically dense materials.	10%
Thin and thick lenses, the use of thin lenses in optical instruments.	5%
How the image form by refraction from thin lenses. Aberration phenomenon.	10%
The formation and focusing of image in the eye. Common vision defects (near sight, and far sight defects), correction vision.	5%
The composition and function of Microscope, Telescope, and other lenses using instruments.	5%
Interference and diffraction of light and the interpretation of semi shadow. Some application of these phenomena. Demonstrating of young's double slit experiment and diffraction grating.	15%
Polarization of light and the application of polarization in eye glass'.	5%
Generation and application of laser in vision, the warmness of laser.	10%

Teaching & Learning Methods

- Using the power point slides.
- Using Windows media player program to display simulation movies for optical phenomena.
- Using Adobe acrobat to display problems.
- Using the board for more explaining.
- Short Seminars and discussion run by the students.

Course Content

Week	Topics	Chapter in Textbook (handouts)
1	Nature of light and speed of light measurements.	35
2+3	Reflection and Refraction of light.	35
4	Huygens's Principle, Dispersion of light & Prisms.	35
5	Geometric Optics, Image formed by Flat and Spherical Mirrors.	36
6	Image formed by Refraction.	36
7	Thin Lens and Camera.	36
8	The image formed by the eye.	36
9	Common Vision Defects.	36
10	Simple Magnifier and Compound Microscope and Telescope.	36
11+12	Interference of light.	37
13	Diffraction and Polarization.	38
14	Laser Light: Properties and applications.	38

Course Content

Week	Date	Title of the Lecture	Lecturer
1		Nature of light and speed of light measurements.	
2		Laws of Reflection of light.	
2		Laws of Refraction of light (Snell's law)	
3		Huygens's Principle, Dispersion of light & Prisms.	
3		Prove of law of reflection using Huygens's Principle	

4		Prove of Snell's law using Huygens's Principle	
5		Geometric Optics, Image formed by Flat.	
6		Image formed by Spherical Mirrors.	
7		Image formed by Refraction	
8		Image formed by Concave lenses	
9		Image formed by Convex lenses	
10		Function of Camera:	
11		Image formed by the eye.	
12		Common Vision Defects.	
13		Combination of two lenses.	
9		Seminars and discussions.	